

différents que nous ne nous sommes pas cru en droit d'altérer ou de changer."

M. de Fréminville feels that there is little doubt that Adam Smith's classic description of the manufacture of pins as an illustration of the principle of the division of labor was based on these two studies of Perronet. Smith had, of course, developed his theory of the division of labor in his Glasgow lectures, which was based on de Mandeville's "Fable of the Bees"; but, instead of using de Mandeville's examples from the production of clocks and watches, he mentions the manufacture of pins as divided into eighteen operations. As Smith had reviewed at considerable length *l'Encyclopédie* in his letter in the second number of the *Edinburgh Review*, published in January, 1756, there is every reason to suppose that he had read M. Delaire's article on the manufacture of pins and thought the illustration more up to date.⁴ It is quite possible, moreover, that later when he was in Paris consorting with the physiocrats, he might have learned of the two manuscripts of Perronet which were then in Diderot's hands, as the question of the division of labor seems to have been a matter of interest according to the statement quoted above. In "The Wealth of Nations," Smith speaks of the trade of pin maker as "one in which the division of labour has been very often taken notice of"; and, though he claims to have visited a "small manufactory of this kind where only ten men were employed," he seems familiar with studies of "some manufactories" where eighteen distinct operations were performed by different workers. How responsible the latter were for his selection of the pin industry as an example of the advantages of the division of labor is a question. But at least there are now records of two excellent studies on the division of labor in the manufacture of pins thirty-six years before his classic example appeared.

Perronet's claim to an important place in the history of scientific management is perhaps more easily established, as he became a famous builder of bridges and founded the Ecole des Ponts et Chaussées de France, the predecessor of the Ecole Polytechnique. M. de Fréminville describes his method in the two memoirs as follows:

"Il s'attache au prix de revient, qu'il note pour chaque opération élémentaire, tout en observant la façon dont le travail humain est utilisé, la mesure

⁴Cannan in his edition of *The Wealth of Nations* also expresses the opinion that Adam Smith was doubtless familiar with the Delaire article.

dans laquelle la production est limitée par la fatigue, etc."

Besides these two studies, many of his plans have been preserved in *Les Oeuvres de Perronet* (1788) which contain careful detailed studies of elementary operations, scientific co-ordination of the different tasks and wage studies, based on the work performance which would have delighted Taylor. Furthermore, to quote again from M. de Fréminville, ". . . il est impossible d'avoir poussé plus loin qu'il ne l'a fait l'art de prévoir." All his plans were completed in the minutest detail before any work was commenced, as for instance the bridge of Louis XVI which it took five years to construct.

The following quotations from *Les Oeuvres de Perronet* illustrate the method as well as the resourcefulness of this scientist:

Specifications for the construction of the bridge Louis XVI.

Par. 137: The work of each chaplet (of the pumps for draining) will be done by twelve laborers, four of whom will work together at their winches. An equal number will relieve them every two hours without discontinuance, day and night, so that the work of each man will be reduced to eight hours out of twenty-four. Only three men will be needed on each relay when the rise of the river is only two feet above the low water mark because the water will then be four feet less in depth than when it comes from the higher drain pipe at the head of the chaplet, which will make a diminution of nearly one-fourth of the depth of the column of water from the whole chaplet.

Par. 138: The workmen employed at the pumps will be paid for so many turns of the winch and not by the day as is the custom, and for this purpose there will be placed at the head of each chaplet a suitable machine to count the turns of the winch according to a model which will be given.

Par. 145: Enough pile drivers will be employed so that the work can be carried on night and day without interruptions. The workmen will be paid by the piece.

Thus the rediscovery of Perronet by M. de Fréminville adds a bit of possible evidence with regard to the sources of material used by Adam Smith and at the same time gives to "scientific management" a hitherto unknown alien ancestor.

Annual Business Meeting

THE meeting was called to order by H. S. Person, Managing Director, at 4 P.M., December 6, 1928, in Room 611, Engineering Societies Building, 29 West 39th Street, New York.

⁵De Fréminville, *op. cit.*, p. 201.
⁶*Les Oeuvres de Perronet* (1788) quoted by de Fréminville and translated by the writer.

As a quorum was not present, and it was disclosed that members were still engaged in an educational session, at which President Morris L. Cooke was presiding at Rumford Hall, 50 East 41st Street, the meeting in Room 611 was, therefore, adjourned to reconvene at Rumford Hall at 4:30 P.M.

The reconvened meeting was called to order by the chairman, President Morris L. Cooke. After determining the presence of a quorum, the official notice of this meeting and the minutes of the last annual meeting (December 8, 1927) were read by the managing director.

The managing director then presented the report of the treasurer, Edward W. Clark 3rd, who was unable to be present. A small treasury surplus was again reported. This was followed by an informal report presented by the managing director, on the activities, problems and projects of the Society during the past year. He also briefly outlined plans for the coming year. He called attention particularly to the increased work of the Society and announced the addition of two associate secretaries to the staff—Mr. Ernest G. Brown, for information service, and Mr. Mason L. Merrill, for membership and publicity service. The secretaryship occupied by Mr. Merrill was made possible by a gift from the Twentieth Century Fund for a period of one year.

The Ballot Committee reported the results of letter ballots for election of officers, as follows:

President and Director—Henry P. Kendall, President, The Kendall Company, Boston, Mass., to succeed Morris L. Cooke.

Vice-President and Director—Henry Bruere, 1st Vice-President, Bowery Savings Bank, New York, to succeed C. Leslie Barnum.

Treasurer—Edward W. Clark 3rd, E. W. Clark and Company, Philadelphia, Pa., to succeed Edward W. Clark 3rd.

Director—Morris E. Leeds, President, Leeds and Northrup, Philadelphia, Pa., to succeed A. B. Rich.

Director—Erwin H. Schell, Massachusetts Institute of Technology, Cambridge, Mass., to succeed Nathaniel G. Burleigh.

Director—H. S. Person, Managing Director, Taylor Society, New York, to succeed H. S. Person.

Nominations were asked for a Nominating Committee to serve for the ensuing year. The following were nominated and chosen: C. Leslie Barnum, (Chairman), New York; Percy S. Brown, Grotton,

N. Y.; Edward Eyre Hunt, Washington, D. C.; Charles W. F. O'Connor, Providence, R. I.; Louise C. Odencrantz, New York.

President Cooke, as outgoing president, commented briefly on the work of the Society and mentioned especially the loyalty of the whole organization staff.

Some Introductions

IT IS with pleasure that we announce the addition of two secretaries to the executive staff of the Society. Mr. Mason L. Merrill becomes an Associate Secretary with responsibility for developing and maintaining intimate contact with the members, ascertaining their judgments concerning its objectives and activities, and their suggestions concerning improvement in its activities and in the services it renders. He will become, as it were, a conduit through which membership advice becomes available to the management, for analysis and incorporation into policies and programs. He will maintain similar contacts with non-member friends of the Society and make their interest and advice also available. Mr. Merrill, a graduate of the University of Nebraska, has had experience as an aviator, during the war, salesman, instructor in the Department of English at the University of Wisconsin and on the reportorial staff of the *Baltimore Sun*.

Mr. Ernest G. Brown becomes an Associate Secretary responsible for information service. The Society receives many inquiries, by personal visits and letters, concerning scientific management; how its various phases have been developed here, there and elsewhere; where is to be found the readiest information concerning one or another phase; how to start a particular piece of investigation; and so on. It realizes that the growing volume of such inquiries has become greater than can be properly handled by the original staff—we have to acknowledge, to our regret and with apologies, that they have not been properly handled—and the addition of a secretary responsible for such matters marks the beginning of a new and much better service of the Society to its members. Mr. Brown, a graduate of Yale University, has had a dozen years' experience in the Acme Wire Company, New Haven, first assisting in developing scientific management and latterly as an operating executive.